

NATURAL FEATURES

Topography and Slopes: Dudley's topography is primarily comprised of small hills (drumlins), gently sloping fields and meadows, and low level valley areas. Steep slopes and drastic changes in terrain are not common features. The Town's topography ranges from a low of roughly 350 feet above sea level in the valley area directly abutting the Quinebaug River, to almost 840 feet above sea level near King Road in northwest Dudley.

Watersheds: Dudley encompasses roughly 14,004 acres, and the land is pretty evenly split between two regional drainage basins (watersheds): the French River basin and the Quinebaug River basin. Roughly 6,687 acres (48% of the town) fall within the French River Watershed, and roughly 7,317 acres (52% of the town) fall within the Quinebaug River Watershed.

The French River Basin ranges from Leicester, Massachusetts in the north and extends south to Killingly, Connecticut. The Massachusetts portion of the French River Watershed constitutes roughly 60,595 acres and is shared by the towns of Dudley, Webster, Oxford, Charlton, Spencer and Leicester (the headwaters community). The Quinebaug River Basin ranges from Warren, Massachusetts in the north and extends south all the way to Preston, Connecticut. The Massachusetts portion of the Quinebaug River Watershed constitutes roughly 98,454 acres and is shared by the towns of Dudley, Southbridge, Charlton, Sturbridge, Holland Brimfield, Wales, Brookfield and Warren (the headwaters community). See the Watersheds and Surface Water Resources Map for a graphic depiction of Dudley's location within these two regional watersheds.

In 1999, the University of Massachusetts-Amherst prepared the draft French-Quinebaug Watershed Plan for the Massachusetts Department of Environmental Protection's French-Quinebaug Watershed Basin Team. This document provided an analysis of the drainage patterns found in the two watersheds. Dudley's portion of the Quinebaug River Watershed has what is known as a "parallel" drainage pattern, that is, elongated landforms (including glacial drumlins) that constrict and direct the drainage pattern. The French River Watershed has what is known as a "dendritic" drainage pattern, that is, uniformly resistant crystalline rocks with a gentle regional slope.

Dudley's drainage pattern can be further broken down into five sub-watersheds (shown on the Watersheds and Surface Water Resources Map). Selected details for Dudley's five drainage basins are presented below.

Quinebaug Sub-Watershed

Regional watershed location: Quinebaug

Size in acres: 4,685

Acres of wetlands: 207

Waterbodies: Sylvestri Pond and Blood Pond.

Watercourses: Quinebaug River and several small streams.

Drainage pattern in Dudley: water from the northern section of this sub-watershed drains in a southerly direction until it reaches the river; water from the southwestern corner drains in a northeasterly direction until it reaches the river.

Tufts Brook Sub-Watershed

Regional watershed location: Quinebaug

Size in acres: 2,632

Acres of wetlands: 89

Waterbodies: Wielock Pond and Conant Pond.

Watercourses: Tufts Brook and several small streams.

Drainage pattern in Dudley: The headwaters of the Tufts Brook begins in north Dudley near Dresser Hill and flows in a southerly direction until its confluence with the Quinebaug River in Thompson, Connecticut.

Gore Pond Sub-Watershed

Regional watershed location: French

Size in acres: 688

Acres of wetlands: 37

Waterbodies: Gore/Baker Pond and Shepherd Pond.

Watercourses: several small streams.

Drainage pattern in Dudley: water drains east into Gore Pond and then flows in a northerly direction until it empties into the South Charlton Reservoir.

Merino Pond Sub-Watershed

Regional watershed location: French

Size in acres: 3,698

Acres of wetlands: 112

Waterbodies: Merino Pond, Hayden Pond, Pierpoint Pond, Wallis Pond, Larner/Sawmill Pond, Peter/Parker Pond, Mosquito/Tobins Pond, Easterbrook Pond, New Pond, and Low Pond.

Watercourses: several small streams.

Drainage pattern in Dudley: water drains east and west into the ponds and then flows in a southerly direction into Merino Pond. From here, water drains in a south-easterly direction into the French River. The only exception is Pierpoint Pond which has a dike at its southern-most end

that causes its water to flow in a northerly direction into Charlton.

French River Sub-Watershed

Regional watershed location: French

Size in acres: 2,301

Acres of wetlands: 64

Waterbodies: Packard Pond and Perry Pond.

Watercourses: French River, Potash Brook and several small streams.

Drainage pattern in Dudley: This sub-watershed encompasses Dudley’s entire frontage on the French River. Surface water drains in a southeasterly manner into the River.

Rivers and Streams: There are two major rivers and two significant streams in Dudley. The French River forms the Town’s eastern-most boundary line, with Webster’s downtown located right across the river. The Quinebaug River cuts diagonally across Dudley’s southwest corner. The Tufts Brook begins in the middle of Town and flows in a southerly direction until its confluence with the Quinebaug in Thompson, Connecticut. Potash brook begins near Shepherd Hill Regional High School and flows in a southeasterly direction until its confluence with the French River, not far from the railroad bridge.

The table below presents selected data for Dudley’s significant rivers and streams. The presented data includes: the name of the watercourse; its length in Dudley; its sub-watershed location; whether the watercourse is free-flowing or dammed; and the level of shoreline development activity. The issue of water quality will be discussed as a separate item.

Table NF-1

Significant Watercourses in Dudley

<u>Name</u>	<u>Sub-Watershed Location</u>	<u>Length in Miles</u>	<u>Free-Flowing or Dammed</u>	<u>Shoreline Development Activity</u>
Quinebaug River	Quinebaug	3 miles	one dam (near W. Dudley Rd.)	light
French River	French	3.75 miles	two dams (one near Cemetery Rd.) (one north of Stevens Mill)	moderate from Intermediate School through

				Chaseville area; light elsewhere
Tufts Brook	Tufts	2.8 miles	free-flowing	light
Potash Brook	French	2.5 miles	free-flowing	moderate to heavy near the Merino Village area

Source: USGS topographic maps and dam data provided by the DEM Division of Dam Safety.

Generally speaking, the river profiles of the French and Quinebaug are such that Dudley's portion of these rivers have lower energy systems than the river segments with higher elevations in the north (1999 DEP draft Watershed Plan). The Quinebaug River drops from an elevation of 600 feet at the Westville Dam down to 400 feet at Cady Brook confluence in Southbridge. This drop in elevation takes place within a length of three miles. The steeper the drop, the more energy is created by the river. Once in Dudley, the Quinebaug River slows down considerably, with its elevation dropping by less than 100 feet over a length of eight miles until its confluence with the French River in West Thompson, Connecticut. The French River shows a similar profile. From the River's headwaters, there is a 400 feet drop in elevation over a 12-mile span. From Clara Barton Pond in Oxford, the River's elevation drops by 150 feet over a 20-mile span until the its confluence with the Quinebaug River.

Waterbodies: There are 14 waterbodies in Dudley having at least ten acres in size. There are also numerous smaller ponds scattered throughout Town. Most of Dudley's major ponds fall within the Merino Pond Sub-watershed. The table on the next page presents selected data for Dudley's significant waterbodies. The presented data includes: waterbody name; sub-watershed location; whether the pond is free-flowing or dammed; and the level of shoreline development activity. The issue of water quality will be discussed as a separate item.

Table NF-2
Significant Waterbodies in Dudley

<u>Name</u>	<u>Sub- Watershed</u>	<u>Size in Acres</u>	<u>Free-Flowing or Dammed</u>	<u>Shoreline Development Activity</u>
Gore/Baker Pond	Gore	169 (94 in Dudley) (74 in Charlton)	one dam	light
Pierpoint Pond	Merino	90 (82 Dudley) (5 Charlton)	one dike	moderate- to-light

Shepherd Pond	Gore 18	one dam	light
Hayden Pond	Merino 41	free-flowing	moderate
New Pond	Merino 30	one dam	light
Wallis Pond	Merino 23	one dam	minimal
Larner/ Sawmill Pond	Merino 25	one dam	light
Peter/Parker Pond	Merino 44	one dam	light
Merino Pond	Merino 72	two dams	heavy
Blood Pond	Quinebaug 21 (6 in Dudley) (15 in Charlton)	free-flowing	none
Sylvestri Pond	Quinebaug 18	one dam	minimal
Mosquito/ Tobins Pond	Merino 9	free-flowing	minimal
Easterbrook Pond	Merino 5	free-flowing	minimal
Wielock Pond	Tufts 5	one dam	minimal
Packard Pond	French 6	free-flowing	light
Conant Pond	Tufts 1	free-flowing	minimal
Perry Pond	French 8 (3 in Dudley) (5 Thompson)	one dam	none

Source: Massachusetts Department of Environmental Protection (DEP) and dam data provided by the DEM Division of Dam Safety.

There are also two unnamed man-made ponds in the French River sub-watershed. Both are roughly ten acres in size and are located west of New Boston Road. Another unnamed pond can be found in the French River sub-watershed just west of Sunnyside Road. All told, Dudley's waterbodies and small ponds comprise roughly 600 acres, or 4.3% of the Town's total land area.

It should be noted that the two Merino Pond dams currently have a "high hazard" designation from the DEM Dam Safety Division. Such dams present a high risk of damage to downstream

properties in the event of a breach or overtopping of the dam. DEM offers grant money to municipalities for dam repair, and Dudley received funding in 1998 to make repairs to the Merino Pond dams and the New Pond dam.

A number of Dudley's ponds are very shallow. The average depth of Dudley's ponds rarely exceeds ten feet; thus, the sections subject to deposition (e.g. where streams enter) usually support vigorous weed growth due to the combined effects of high nutrient levels and sunlight penetration.

According to the document, An Inventory of the Ponds, Lakes, and Reservoirs of Massachusetts, prepared by the University of Massachusetts Water Resources Research Center in 1972, Hayden Pond is the deepest pond in Dudley with a maximum depth of 33 feet. Merino Pond had a maximum depth of 20 feet, and Pierpoint Pond had a maximum depth of 14 feet. This document identified that the vast majority of Dudley's ponds were undergoing eutrophication, the process whereby ponds age. Problems associated with eutrophication include elevated levels of phosphorus and nutrients which lead to an increase in biological activity (excessive plant growth), which in turn depletes the pond's oxygen supply. Ponds with depleted oxygen supplies have trouble supporting aquatic life.

Water Quality: It is well known that both the Quinebaug and French rivers were the source of power for the textile mills that flourished in the later part of the 19th century and the early part of the 20th. In fact, there are still active mills located along the French (the Stevens Linen Mill as a local example). The rivers were also major transportation corridors for shipping goods, materials and finished products. The industrial use of these rivers has resulted in serious water quality problems that will take a long time to rectify. A 1940 report prepared by the State Department of Public Health noted that the Quinebaug River was "often discolored with industrial wastes (7,752,000 gallons per day)" and made reference to the "markedly reddish color of the river below Southbridge", which was attributed to the "rouge" used as an abrasive in grinding lenses. A 1974 report by the Massachusetts Water Resource Commission (MWRC) noted a milky white color below the West Dudley Paper Company site and prolific algae blooms further down the river. The 1974 study noted that the French River in the Dudley/Webster area had the "general appearance...of pea soup, although the color may vary from blue to green to rouge."

Industrial discharges created sludge and sedimentation, particularly in the ponds and impoundments behind dams. Nutrient and coliform levels were out of sight. The 1974 report noted that the impoundment behind the Perryville dam (no longer active) was known to have a "sludge deposit [that] had accumulated on the bottom, pieces of which occasionally came loose and floated to the top" and "coliform bacteria counts skyrocketed up to the million level count." Most of the mills along the French and Quinebaug have shut down and the ones that remain follow strict NPDES (National Pollution Discharge Elimination System) permit requirements.

Municipal wastewater treatment plants have also been a substantial source of pollution for the rivers. A 1990 report by the MWRC identified the Oxford-Rochdale treatment plant along the French and the Southbridge treatment plant along the Quinebaug as significant contributors of high nutrients and organic loads. The area's treatment plants have all received significant upgrades during the 1980's, with the Webster/Dudley plant receiving an upgrade in 1988. These upgrades have resulted in a substantial reduction of pollutants in the rivers. According to the 1999 draft Watershed Plan, the major problem associated with today's treatment plants is high

phosphorus loading. The 1990 MWRC report noted that the Southbridge treatment plant alone contributes 88% of the Quinebaug's phosphorus loading and 71% of its ammonia-nitrate loading.

The municipal treatment plants and the industries discharging into the rivers are known as "point" pollution sources, that is, a pollution source that can be traced back to a single location. The past few decades have seen a marked reduction in the amount of pollutants entering the rivers from point pollution sources. Although the water quality of these rivers has improved dramatically, much remains to be done. Today, the primary pollution problems for the French and Quinebaug rivers are what's known as "non-point" pollution sources, that is, pollution sources that are diffuse in nature and discharge pollutants over a broad area. Typical non-point pollution sources include: stormwater runoff, manure leachate, septic systems, pesticides, road salt, erosion, etc. It is these non-point pollution sources that the watershed communities will need to address in order to further improve the water quality of the French and Quinebaug rivers.

The Department Environmental Protection Agency (DEP) designates six classes of water quality, based largely on the standards of the Federal Clean Water Act. In Massachusetts, Class A refers to those surface water resources that are used as water supply sources. Class B waters are considered safe for fishing, swimming and boating. The remaining four water quality categories cover those surface water resources with lesser water quality. The majority of the surface water resources in the French and Quinebaug Watersheds meet the Class B water quality standards. There are, however, several ponds and river segments that do not meet the Class B standards.

Under the regulations of the Federal Clean Water Act, states are required to file a report every two years that identifies those surface waters that are not expected to meet the Act's surface water quality standards (Class A, Class B, etc.). This report, known as the Massachusetts Section 303(d) Lists of Waters, was last prepared in 1999 and includes an assessment of water quality data collected in 1998. The table below lists those surface waters in Dudley that, according to the 1998 303(d) report, *do not* meet the water quality standards of the Federal Clean Water Act.

Table NF-3

Surface Water Resources with Water Quality Problems

<u>Surface Water Resource</u>	<u>Sub-Watershed</u>	<u>Pollutants/Stressors</u>
Sylvestri Pond	Quinebaug	noxious aquatic plants
Wielock Pond	Tufts	turbidity
Quinebaug River	Quinebaug	nutrients & pathogens
(from Southbridge treatment plant to W. Dudley)		
Easterbrook Pond	Merino	noxious aquatic plants
Gore/Baker Pond	Gore	noxious aquatic plants/turbidity
New Pond	Merino	noxious aquatic plants
Packard Pond	French	noxious aquatic plants

Peter/Parker Pond	Merino	nutrients, low dissolved oxygen, & organic enrichment
Pierpoint Pond	Merino	noxious aquatic plants
<u>Surface Water Resource</u>	<u>Sub-Watershed</u>	<u>Pollutants/Stressors</u>
Shepherd Pond	Gore	noxious aquatic plants
Wallis Pond	Merino	noxious aquatic plants
Larner/Sawmill Pond	Merino	noxious aquatic plants
Mosquito/Tobins Pond	Merino	noxious aquatic plants
French River (from North Dam to Dudley/Webster treatment plant)	French	habitat alterations & pathogens
French River (from Dudley/Webster treatment plant to Connecticut border)	French	nutrients, pathogens, odor & color, taste, organic enrichment, low dissolved oxygen, & turbidity

The previous table clearly indicates that Dudley's ponds are having a serious problem with noxious aquatic plants. This is typical for waterbodies in the process of eutrophication. Since none of these ponds (with the exception of Merino) have public boating access, it is unlikely that the plants are of the invasive species variety. Rather, their presence and expansion within Dudley's ponds is partly due to the shallow nature of the ponds, which has exacerbated the process of eutrophication. The sun is a factor for aquatic plant growth, and shallow ponds are very susceptible to the effects of sunlight. The proliferation of aquatic plants is also partly due to local non-point pollution sources such as stormwater runoff and road salt applications, which can increase the conductivity within small ponds.

A future water quality concern for the Quinebaug River will be the construction of the Millenium Power Plant in Charlton, currently in progress. Once on-line, this natural gas power plant will employ a cooling system that will use two million gallons per day. The majority of the water used for this process will come from the Southbridge wastewater treatment plant. The power plant will use wastewater from Southbridge for its cooling system and then return the water to the Southbridge treatment plant for additional treatment. However, the power plant does have a permit from the State to withdraw water from the Quinebaug River for its cooling system.

Although it is unlikely that the plant will use river water on a regular basis, the river's existing low flow problems may be exacerbated on those occasions when river water is used. Low flow rates in a river can exaggerate existing water quality problems by increasing the concentration of pollutants. Conversely, the more water in the river, the more pollutants are dissolved. In an effort to gauge the true impact of the Millenium Power Plant, the Massachusetts Departments of Environmental Protection and Environmental Management, along with Professor Mauri Pelto of Nichols College, have begun flow studies for the river.

Wetlands: Dudley has a total of 509 wetland acres. This represents roughly 3.6% of the Town's total land area. Over 200 acres of wetlands fall within the Quinebaug Sub-Watershed and these wet areas are primarily associated with the perennial streams that flow into the Quinebaug River. There is a significant concentration of wetlands east of Tracy Road extending all the way over to Corbin Road. A graphic depiction of Dudley's wetlands can be seen on the Watersheds and Surface Water Resources Map. The amount of Dudley's wetlands has been calculated by several governmental/educational entities over the years. However, by all accounts, the amount of Dudley's wetlands has actually *increased* over the years due to increased dam activity. Wetlands provide a number of benefits including: flood water storage, wildlife habitat (including vernal pools), pollution filtration, water purification, and groundwater recharge.

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Floodplains: A set of Flood Insurance Rate Maps (FIRM) was prepared for Dudley by the Federal Insurance Administration in June of 1982. The preparation of these maps, along with the adoption of a special ordinance dealing with floodplain development, enables Dudley to participate in the National Flood Insurance Program (NFIP). The NFIP allows residents living in flood hazard areas to purchase flood insurance at a low cost. The FIRMs identify 100-year floodplains, that is, those areas that are likely to flood once within a 100-year period. The extent of Dudley's 100-year floodplains, as identified by the FIRMs, can be found on the Floodplains and Habitats Map on the following page. The majority of Dudley's 100-year floodplains are associated with the French and Quinebaug rivers. In fact, the entire length of these rivers in Dudley have floodplains adjacent to them. A number of ponds in Dudley also have 100-year floodplains associated with them. Flooding has not been a major problem for the French River since the construction of the Hodges Village Flood Control Dam in Oxford. All told, there are 939 acres of 100-year floodplains in Dudley, or roughly 6.7% of the Town's total land area.

Aquifers: Aquifers are subsurface concentrations of groundwater. Essentially, aquifers are underground sinks where water is stored. Aquifers are found where land surfaces are permeable and the storage and transmission of water can take place. Aquifers having medium-to-high potential to yield groundwater occur in Massachusetts as alluvial deposits of sand and gravel.

Dudley's aquifers were mapped by the US Geological Survey (USGS) back in the early 1980's. The USGS characterizes aquifers by the amount of water they can yield per minute and by their transmissivity. The term "transmissivity" refers to the rate at which water is transmitted through a unit width of aquifer under a unit hydraulic gradient, and is expressed in units of feet squared per day. The transmissivity (T) of an aquifer is equal to the horizontal hydraulic conductivity (K) of the aquifer multiplied by its saturated thickness (b); thus, $T=Kb$. The USGS defines "high yield" aquifers as those aquifers that can yield over 300 gallons per minute and have transmissivities of over 4,000 square feet per day. "Medium yield" aquifers can yield 100-300 gallons per minute and have transmissivities of 1,400-4,000 square feet per day. According to the USGS, there are five medium-to-high yield aquifers in Dudley.

Dudley's largest aquifer is the Schofield Avenue aquifer at 110 acres (62.2 acres of medium yield and 47.8 acres of high yield). There are two wells operated by the Dudley Water Department located in the high yield portion of this aquifer (Stations #3 and #6). This aquifer is

in close proximity to the French River, however, the full extent of the hydrologic connection has not been determined as of this date.

There is an aquifer at the southern base of Merino Pond. This aquifer has 28 medium yield acres and 7.5 high yield acres, for a total size of 35.5 acres. The Merino Pond wellfield operated by the Dudley Water Department (Station #1) is located in the high yield portion of this aquifer. There is a hydrologic connection between this aquifer and Merino Pond, however, again the full extent of this connection has not yet been determined.

There is an 8.4 acre high yielding aquifer located at the southern base of New Pond. The full extent of the aquifer's hydrologic connection to the Pond has not yet been determined. The aquifer's small size may preclude its use as a future water supply source for the Dudley Water Department. The same can be said for the two small high yielding aquifers (2.4 acres and 4.4 acres respectively) located in close proximity to the Quinebaug River.

There are two significant aquifers located outside of Dudley, but in close proximity. There is a 251 acre medium-to-high yield aquifer in Webster located adjacent to the French River. Webster's municipal water system has a well located in the high yield portion of this aquifer. Additionally, there is a large (941 acres) medium-to-high yield aquifer located in the southern corner of Oxford, adjacent to the French River. Oxford's municipal water system has a well located in the high yield portion of this aquifer. The locations of Dudley's aquifers, and those of its adjacent neighbors, can be seen on the Groundwater Resources Map found on the next page.

Soils: The Natural Resources Conservation Service (NRCS) of the US Department of Agriculture published the Soil Survey of Worcester County, Massachusetts, Southern Part, in 1998. The Town of Dudley was included in this effort. Generally speaking, there are four major types of soils in Dudley. These soil types, and their locations in Town, are described below:

Paxton-Woodbridge-Ridgebury soil type: nearly level to steep, very deep, well drained to poorly drained soils on glaciated uplands. This soil type consists of soils on upland hills and ridges dissected by many small drainage ways. In Dudley, this soil type covers the land between the Quinebaug River and Route 31. It can also be found as a small strip around Gore Pond, extending to the western shore of Pierpoint Pond. This soil type also covers the northeastern corner of Town.

Canton-Montauk-Scituate soil type: Nearly level to steep, very deep, well drained soils on glaciated uplands. This soil type consists of soils on upland hills and rolling glacial till flats. It is dissected by broad drainageways that flatten out on the lower slopes. This soil type covers the southwestern corner of Town, south of Route 131 and the Quinebaug River. There is also a large swath of this soil type beginning at the Connecticut border and extending north to the Corbin Road area. It is bound to the west by Dudley-Southbridge Road and bound to the east by Mason Road.

Merrimac-Hinckley-Windsor soil type: Nearly level to steep, very deep, excessively drained and somewhat excessively drained soils on outwash plains. This soil type consists of soils on broad,

flat plains and in rolling to steep areas, and was formed by water-sorted deposits of glacial outwash. This soil type appears in Dudley at two locations. The first concentration is a long swath along Dudley's length of the French River, jutting into the Town at two points: near the Indian Road area in southern Dudley, and a long patch covering the land alongside Dudley's interconnected ponds (Merino Pond, Lerner Pond, Wallis Pond, New Pond, Hayden Pond and Pierpoint Meadow Pond). The second concentration of this soil type covers a small strip located along both sides of the Tufts Brook.

Freetown-Swansea-Saco soil type: Nearly level, very deep, very poorly drained soils on uplands, outwash plains and floodplains. This soil type consists of soils on broad flats that have small depressions. These soils are in old glacial lakes or small ponds adjacent to streams. The soil formed in organic deposits and alluvium. This soil type appears in Dudley as a long strip along both sides of the Quinebaug River, extending over to the Wielock Pond area.

With the exception of the last soil type, all of Dudley's soils are suitable for crop cultivation, hay fields and pasture lands. In fact, the first three soil categories have qualities that fall under the USDA's "Prime Farmland" designation. Deep, well-drained soils are quite beneficial for growing crops.

Surficial and Bedrock Geology: Dudley's current surficial geology was formed by glaciation several thousands of years ago. This glaciation rounded and smoothed the mountains within the French and Quinebaug drainage basins, and smaller hills were buried in till consisting of silt, fine sands, cobbles and boulders (1999 Draft Watershed Plan). Glacial drumlins abound in Dudley's portion of the Quinebaug Watershed, while sand and gravel deposits are found along the French River valley.

The USGS mapped the structural and bedrock geology of the central Massachusetts region in 1983. Structurally, Dudley's bedrock geology is part of the central upland of Massachusetts known as the Worcester County Plateau. Dudley's structural and bedrock geology do not have much impact on land use, as much of the bedrock is covered by glacial deposits and deep soils. Faults in the bedrock are inactive and pose no threat to development (1999 Draft Watershed Plan). The only problems posed by the Town's bedrock geology are those few locations where bedrock outcroppings are found and ledge is close to the surface.

Flora and Fauna: Dudley's forest covered hills, open fields and cropland, pastures, riverbanks, forested wetlands and marshes provide a diversity of habitats for wildlife. Fish can be found in both the French and Quinebaug rivers. A number of Dudley's ponds contain warm water and produce excellent pan fish populations. Hayden Pond has sufficient cold water to allow the Division of Fisheries and Game to stock trout annually. The French River and Tufts Brook are also stocked with trout as well. Tobin/Mosquito Pond is an important habitat for waterfowl and muskrats (Dudley Open Space and Recreation Plan, 1988-1992).

A comprehensive list of wildlife living in the French/Quinebaug watersheds was compiled for the French River Greenway Plan in 1990. This list was further supplemented by the Audubon Society and a local environmental consultant for the draft French-Quinebaug Watershed Plan in early 1999. Listed below are the various forms of wildlife found in the two major watersheds that cover the Town of Dudley.

<u>Fish</u>	<u>Birds</u>	<u>Reptiles and Amphibians</u>
Northern Blacknose Dace	Blue-Winged Teal	Marbled Salamander
Native Brown Trout	Wood Duck	Jefferson Salamander
Bluegill	Black Duck	Blue-Spotted Salamander
American Eel	Mallard Duck	Spotted Salamander
River Dace	Osprey	Northern Dusky Salamander
<u>Fish</u>	<u>Birds</u>	<u>Reptiles and Amphibians</u>
Black Crappie	Northern Harrier	Northern Two-Lined Salamander
Chain Pickerel	Wild Turkey	Red-Spotted Newt
Yellow Bullhead	Ruffed Grouse	Eastern American Toad
Brown Bullhead	Woodcock	Fowler's Toad
Large Mouth Bass	Great Horned Owl	Spring Peeper
Small Mouth Bass	Barred Owl	Gray Tree Frog
Yellow Perch	Red-Headed Woodpecker	Bull Frog
White Perch	Black-Backed Woodpecker	Green Frog
Yellow Horned Pout	Pileated Woodpecker	Leopard Frog
White-Bellied Horned Pout	Yellow-Bellied Woodpecker	Snapping Turtle
Redfin Shinner	Kingfisher	Box Turtle
Pumpkin Seed	Phoebe	Painted Turtle
White Sucker	Warblers	Northern Water Snake
Carp	Flycatcher	Northern Brown Snake
Northern Pike		Northern Redbelly Snake

Eastern Garter Snake

Mammals

Red Fox, Star-Nosed Vole, Red-Backed Vole, Meadow Vole, and Eastern Cottontail Rabbit

In addition to the common wildlife found in the watersheds, the Massachusetts Division of Fisheries, Wildlife and Law Enforcement (DFWLE) have identified rare animal *and* plant

species for the towns in the watersheds as authorized by the Massachusetts Rare and Endangered Species Act of 1990. Through their Natural Heritage and Endangered Species Program, the DFWLE has identified 35 rare vertebrate, invertebrate, and plant species in the two watersheds. The DFWLE designates the status of the species by using three categories: endangered, threatened or special concern. In Dudley's case, there is only one species listing and that is for the Marbled Salamander which is listed as "threatened".

The Natural Heritage Program maps two types of habitats: "priority habitats" and "estimated habitats for rare wildlife". The Program defines "priority habitats" as the approximate location of the most important sites for rare species (flora and fauna) in Massachusetts. The Program defines "estimated habitats for rare wildlife" as those habitat areas where rare wildlife have been observed over a 25-year period.

In Dudley's case, there are four "priority habitat" areas. The first area begins in Southbridge and extends into Dudley just above the Quinebaug River; the second area is a narrow strip along the shoreline of the French River; the third is an area located between Sylvestri Pond and King Road; while the fourth is an area between Baker Pond Road and Ramshorn Road. All of these "priority habitat" areas are also considered to be "estimated habitats for rare wildlife", with the exception of the Baker Pond Road/Ramshorn Road site.

The Heritage Program knows what types of rare/endangered plant and animal species are found in the above locations, however, under the law this information cannot be made available to the public. The reason is that the Rare and Endangered Species Act does not want to promote the taking of these resources, and identifying the particular species found in a certain habitat area may encourage their taking. The general location of Dudley's habitat areas are depicted on the Floodplains and Habitats Map.

Environmental Protection Efforts: Presented below are a partial listing of the environmental protection efforts, both regulatory and non-regulatory, of the various levels of government (federal, state, regional, local) with relevance and jurisdiction in Dudley.

Federal Environmental Protection Initiatives

- *Federal Clean Water Act*: The Act sponsors numerous programs designed to improve our nation's drinking water quality. Programs under the Act include assessment (Section 303[d]), planning (Section 604[b]), and implementation (Section 319). Wetland alteration activities are regulated by Section 404 of the Act, with the Army Corps of Engineers being the permitting authority. Drinking water quality standards and testing standards are also outlined in the Act.
- *National Flood Insurance Program*: as stated previously, this program maps a community's 100-year flood hazard areas and allows residents living in these areas to purchase flood insurance at a low cost.
- *US Rivers and Harbors Act*: Section 10 of the Act requires a permit to be issued from the Army Corps of Engineers before any alteration of navigable waters in the U.S. can occur. Both the French and the Quinebaug rivers are considered to be "navigable waters" under the Act.

- *Land and Water Conservation Fund*: Administered jointly by the National Parks Service and the Massachusetts Division of Conservation Services, this program offers communities money for land acquisition and planning/building outdoor recreation facilities. Funds from this program can be used to purchase environmentally sensitive lands.
- *Community Septic Management Program*: as mentioned in the housing chapter, this program was developed by the US Environmental Protection Agency and is administered at the State level by the Department of Environmental Protection. The program makes loans available to home owners for septic system repairs. Dudley has been involved in this program since 1997.
- *USDA Natural Resources and Conservation Service (NRCS)*: Operating within the US Department of Agriculture, the NRCS offers two environmental protection programs. First, the Resource Conservation and Development program offers funds to municipalities for the planning and development of water-related recreation facilities, fish and wildlife resource development, and water quantity and quality management. Funds can be used for land acquisition and facilities development. Secondly, the Watershed Protection and Flood Protection program provides funding for projects that protect watershed resources such as flood protection, and wildlife management.
- *National Pollution Discharge Elimination System (NPDES) Permits*: Under the authority of the US Environmental Protection Agency, these permits are necessary before any discharge of treated wastewater into a surface water resource. All of the municipal sewage plants that discharge into the French and Quinebaug rivers have such a permit in place, as do the remaining industries that discharge to these rivers. The permits set forth site-specific water quality standards and discharge limitations.

State Environmental Protection Initiatives

- *Rivers Protection Act*: This act is an amendment to the earlier Wetlands Protection Act. The new act regulates development along rivers, streams, lakes, ponds as well as wetlands. While the use of land in these areas is restricted, development is not prohibited.
- *Title V Septic Regulations*: These are the regulations that cover the siting and construction of on-site septic systems. They are of particular importance for land abutting the ponds and the more rural areas of Dudley where municipal sewer is unavailable.
- *Zone II Wellhead Protection Regulations*: Administered by the Massachusetts

Department of Environmental Protection (DEP), this program identifies the area of an aquifer that contributes water to a public water well under the most severe pumping and recharge conditions that can realistically be anticipated. Land uses within the identified contribution areas are regulated so as to protect the land area where water is drawn from once a well is in the process of pumping. Zone II contribution areas have been delineated for the two Schofield Avenue wells operated by the Dudley Water Department. The Zone II contribution areas for Dudley are depicted on the Water System Service Area Map found within the Town Government: Facilities and Services chapter.

- *Massachusetts Endangered Species Act*: The Act is administered by the Natural Heritage & Endangered Species Program within the Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement. The Heritage Program identifies rare and endangered plant and wildlife species in Massachusetts, delineates their habitat areas, and provides for their protection.
- *Massachusetts Wetland Protection Act*: Administered by the DEP, the Act regulates activity in and around wetlands. The Act is administered at the local level by a municipality's conservation commission.
- *Water Management Act*: The Act regulates ground and surface water withdrawals of over 100,000 gallons per day. There are detailed environmental performance standards that an applicant has to meet in order to be approved for such large water withdrawals.
- *Areas of Critical Environmental Concern Program*: Administered by the Massachusetts Department of Environmental Management (DEM), this program allows for the identification and protection of critical environmental resource areas. This is a grass-roots type of program in that local entities are responsible for proposing an area for inclusion in the program. There are guidelines as to what types of areas can be nominated for inclusion, and nominations can be submitted by a local municipal entity, a state legislator, a state or regional agency, or simply a group of ten citizens who are willing to prepare the application and conduct the necessary research. There have been no Areas of Critical Environmental Concern identified for Dudley as yet.
- *Riverways Programs*: The Massachusetts Division of Fish, Wildlife and Law Enforcement offer a variety of non-regulatory programs under the umbrella of the Riverways Programs. The Riverways programs offer technical assistance and grant money for a variety of environmental projects such as: citizens water quality monitoring efforts, environmental education, riparian land protection, fish habitat enhancement and recreation.
- *State Grant Opportunities for Environmental Projects*: Massachusetts State agencies offer numerous grant opportunities for environmental projects. Eligible projects range from assessment, planning, implementation, acquisition, construction and maintenance. The grant opportunities are far too numerous to list here, so they are presented as an appendix to this document (see Appendix B). This list is constantly changing and is not considered to be a comprehensive compilation of State-sponsored grant opportunities.

Regional Environmental Protection Initiatives

- *Watershed Management Program*: Administered by the Massachusetts Executive Office of Environmental Affairs, this program has set up a five-year watershed planning and management effort for all of the State's major watersheds. The French River Watershed and the Quinebaug River Watershed have been grouped together for this effort. The draft French-Quinebaug Watershed Plan prepared in 1999 is a direct result of the State's watershed planning and management approach.
- *French River Advisory Committee*: This now dormant committee was responsible for the preparation of the French River Greenway Plan in 1990. The plan sets forth a number of recommendations designed to improve the river's water quality and promote an environmentally sound stewardship of the river. The Committee was comprised of citizens from the Towns of Oxford, Webster and Dudley. The Committee disbanded shortly after the publication of the Greenway Plan in 1990.
- *Quinebaug-Shetucket Rivers Valley National Heritage Corridor*: This area was designated as a National Heritage Corridor by an act of Congress in 1994. The National Heritage Corridor Program is managed at the federal level by the National Parks Service. The designated area covers roughly 1,000 square miles in Massachusetts and Connecticut. The Massachusetts portion of the Corridor was not initially included in the designation, however, the State's congressional delegation successfully lobbied to include the Massachusetts portion in the National Heritage Corridor Program. President Clinton approved expanding the Corridor into Massachusetts in early 2000. The Program's purpose is to encourage grassroots efforts for the preservation and restoration of significant historic and natural assets within the Corridor; foster compatible economic development (including tourism); and enhance recreational opportunities. The Program is administered on the regional level by the Quinebaug-Shetucket Rivers Valley Advisory Council which includes local officials and residents, regional planning agencies and councils of governments, tourism districts and several state agencies. The operating body for the Council is Quinebaug-Shetucket Heritage Corridor, Inc., located in Putnam, Connecticut. The Council has prepared a Management Plan to guide their efforts.

Local Environmental Protection Initiatives

The Dudley Conservation Commission is the local entity charged with administering and interpreting the State's various wetland protection laws and regulations. The Commission's main task is to ensure the integrity of wetland areas in Dudley. The Commission's duties are described below, along with their list of current and on-going projects.

Conservation Commission Duties

WETLANDS: The Wetland Protection Act (1872) is administered by the DEP in conjunction with conservation commissions. In Dudley, the commission regulates wetlands and a 100' buffer zone around them. Wetlands vary from ponds and bogs to less obvious vegetated marshlands. Any development planned for the buffer zone requires Conservation Commission approval, which if given, calls for a permit and specified work conditions such as erosion control measures.

RIVERFRONTS: Under the new Rivers Protection Act (1996) the commission regulates a 200'

'riparian resource area' bordering all permanent streams. Strict best management practices (BMP's) are required for development in these zones.

STORMWATER: In issuing permits for development within protected zones, the Conservation Commission is required to implement the Storm water Management Standards issued by the DEP in 1996. The commission may also call for remedial action for existing discharges under the state's Clean Waters Act.

DAMS: Pond water levels are under the jurisdiction of the Conservation Commission so conservation permits are issued for dam operation. The Commission directly manages the operation of Baker Pond Dam and shares responsibility for dams in the Merino Pond system with the Dudley Water Department, due to the necessity of maintaining the town well aquifer at an optimum level.

VERNAL POOLS: These are temporary ponds important for retarding surface runoff and usually home to rare species of wildlife. The Commission is responsible for certifying such pools and ensuring BMP's in developments in their vicinity.

AGRICULTURAL PRESERVATION (APR): The Commission administers the Agricultural Preservation Restriction Act, which enables farmers to 'sell' their development rights to the state, thereby preventing activities that will negatively impact the future agricultural viability of the land. There are 13 areas of APR land in Dudley, amounting to about 1200 acres, much of it along Route 31.

FOREST CUTTING: The Commission administers DEP regulations for forestry cutting and logging activities in and around wetlands. All forestry operations have to be in compliance with the Forest Cutting Practices Act, administered by the DEM's Bureau of Forestry. Dudley is in the Bureau's District 11 (covering the Quinebaug, French and Blackstone River basins).

WILDLIFE HABITAT : Conserving wildlife habitats was added to the Wetlands Protection Act as a special value in 1986. The Fisheries and Wildlife's Natural Heritage and Endangered Species Program (NHESP) has produced maps of rare species used by the Commission in the permitting process.

Conservation Commission Projects in Progress/Planned

VERNAL POOL CERTIFICATION: The Commission is working with Margaret Washburn (volunteer consultant) to certify about 6 vernal pools in Dudley. Pools certified by the NHESP receive protection under the Wetlands Protection Act, the Clean Water Act, and the Forest Cutting Practices Act. These regulations help eliminate direct impacts to vernal pools and minimize direct impacts.

ARDLOCK ACRES RECREATION PROJECT: The Commission has sought money to post and clean up this area (which includes two sizable ponds), to develop trails and provide a parking area, but no funds have been obtained as yet. The area adjoins the old landfill and has its own share of dumped trash and needs some serious cleaning up. It is a good potential project for agencies such as the court's community service project or the Eagle Scouts. Younger scouts have worked there but the scope of the work proved too heavy. Proximity to the abandoned section of Perryville Road means an exceptionally good bicycle trail could run through here.

WILDLIFE CORRIDORS: The Commission is interested in linking together areas of undeveloped land as wildlife so that animals (such as otters, beavers, fox, etc. can range freely and safely. Such areas would also provide good low-impact recreational land (hiking, mountain biking). The Commission believes such projects would not preclude limited development e.g. homes with large unfenced yards. The Commission is currently looking at two areas:

Northeast Dudley: This is an area to the east of Pierpont Pond comprising land that is Conservation, Audubon, agricultural and private. It extends from Conservation Commission land on Hayden Pond Road, through the Audubon sanctuary and adjoining farmland, north and east to wetlands near Piasta Road. Although this area is privately owned it is too wet for development and some 30 acres have already been offered to the Conservation Commission for purchase. The wetlands reach north into Charlton, providing an extensive natural refuge. Adjoining these areas to the east is another parcel of Audubon land and more Conservation land around Mosquito and New Ponds. These areas, if successfully linked together, would form a natural 'loop' for wildlife and low impact recreation.

South Dudley: This includes Ardlock Acres (conservation land) on the Old Boston Road, the old landfill land and the area of undeveloped land to the north and west - all traversed by the abandoned "Grand Trunk" route which runs across to the Lyons Road area. Funds to post this area are being sought as well as to provide parking for recreation use.

There are several other local municipal entities charged with environmental management responsibilities:

- The Dudley Water Department is responsible for safeguarding the municipal water supply sources.
- The Dudley Sewer Department is responsible for managing the municipal sewer system and evaluating the treatment plant's impact on the French River.
- The Dudley Board of Health is responsible for administering the State's Title V septic system regulations.
- The Dudley Parks and Recreation Department are responsible for maintaining the Town Beach at Merino Pond. The Department takes periodic water and sand samples at the Beach in accordance with the State regulations governing public beaches.
- The Dudley Highway Department is responsible for maintaining the drainage along the Towns public roads.
- The Dudley Land Trust Inc. is a non-profit organization devoted to preserving the rural character of Dudley. Founded in 1991, the Trust does not seek to own land itself, but provides advice and technical assistance to landowners regarding land conservation methods. Over the years, the Land Trust has worked with a number of local farmers to get their lands in the State Agricultural Preservation Restrictions (APR) Program, which enables the landowner to sell the land's development rights to the State.

Natural Feature Issues in Dudley

1. Non-Native Aquatic Weeds in Ponds: The evidence is clear that many of Dudley's ponds have a serious problem with the rapid growth of aquatic weeds that are not native to the area. The proliferation of these weeds has serious implications for the ponds' water quality and their ability to provide habitat for various fish species. Increased biological activity within the affected ponds can reduce the amount of dissolved oxygen, thus endangering fish populations. The Town should investigate its options, both preventative and curative, for dealing with the non-native aquatic weed problem.

One source the Town should review for aquatic weed control options is the document, Eutrophication and Aquatic Plant Management in Massachusetts - Environmental Impact Report, prepared in 1998 by the Water Resources Research Center at the Amherst campus of the University of Massachusetts. The document was prepared at the request of the Massachusetts Departments of Environmental Protection and Environmental Management. Aquatic plant management options described in this document include: chemical treatments, mechanical harvesting, wetland-based treatments, nutrient control strategies, point and non-point pollution source controls, hydraulic controls, dredging and a variety of other weed removal strategies.

2. Stormwater Management and Erosion Control: Dudley's Subdivision Regulations have minimal standards for stormwater management and no erosion control standards whatsoever. When a site is developed, care must be taken to create drainage structures that can accommodate the expected levels of stormwater runoff. Also, down-slope drainage facilities must be evaluated to ensure they can handle the additional stormwater generated by a newly developed site. Failure to adequately plan for a site's drainage and stormwater management needs can result in flooding of the property and adjacent properties, overloading down-slope drainage facilities, soil erosion, and eventually the siltation and sedimentation of nearby surface water resources.

3. Non-Point Pollution Sources: The water quality of the French and Quinebaug rivers has improved dramatically over the past fifteen years as the municipal wastewater treatment plants along their shores have been upgraded, and as industrial discharges have been curtailed. Today, the primary pollution problems for the French and Quinebaug rivers are what's known as "non-point" pollution sources, that is, pollution sources that are diffuse in nature and discharge pollutants over a broad area. Typical non-point pollution sources include: stormwater runoff, manure leachate, septic system leachate, pesticide applications, road salt, erosion, etc. The Town should investigate its options, both regulatory and non-regulatory, for addressing non-point pollution sources.

4. Lack of Detailed Water Quality Data: The State does not conduct detailed water quality testing of Dudley's ponds on a regular basis. The water quality assessments of Dudley's ponds found in the biannual Massachusetts Section 303(d) Lists of Waters reports are cursory at best. A detailed water quality sampling effort would include such factors as dissolved oxygen measurements, pH sampling, fecal coliform bacteria sampling, water temperatures, turbidity assessments, and in some cases an assessment of heavy metals. Most of Dudley's ponds were not assessed for these factors in the document, An Inventory of the Ponds, Lakes, and Reservoirs of Massachusetts, prepared by the University of Massachusetts Water Resources Research Center in 1972.

Detailed water quality sampling should be conducted for all of Dudley's major ponds in order to provide a baseline of water quality data that can be compared against future sampling efforts.

This will allow the Town to track the changes in water quality for Dudley's ponds. Citizens can be trained in water quality sampling techniques very easily and there are four entities that can assist the Town in setting up a citizen's water quality monitoring program:

- the Massachusetts Division of Fish, Wildlife and Law Enforcement (DFWLE) can train citizens under its Riverways Program;
- the Massachusetts Waterwatch Partnership, operating out of UMass Amherst, is available to train citizens, oversee quality control and provide technical assistance;
- the Massachusetts Coalition of Lakes and Ponds is a non-profit organization whose members have experience in designing volunteer-based water quality sampling programs;
- and the Audubon Society has also worked with citizens to set up local water quality monitoring efforts.

5. Preservation of Prime Farmland Soils: It is evident from the results of the citizen survey that Dudley citizens are concerned about maintaining the community's rural character. The numerous open fields and active farms are a big part of this character. As mentioned in the soils section, a majority of Dudley's land contains soils considered to be "Prime Farmland" as designated by the USDA's Natural Resources Conservation Service. Although most of north and west Dudley currently consists of "Prime Farmland" soils, and moreover, active farms, development pressure does have the potential to alter the landscape in less than desirable ways. There are a variety of ways to protect land from development, and these methods will be discussed in the Open Space and Recreation chapter.

Natural Features - Goals

1. Preserve, enhance, and publicize the Town's natural resources, agricultural resources, historic buildings and sites, unique cultural resources and significant views.
2. Maintain and enhance a high quality environment, which can accommodate an attractively built community with minimal impact on air and water quality, and the Town's natural habitats.

Natural Features - Recommendations

1. The Town should investigate its options for dealing with the noxious aquatic weeds that have proliferated in a number of Dudley's ponds. The Town should develop a prioritized list of ponds for remediation, as it will not be financially feasible to address all the ponds at once. The Town should consult with the Massachusetts Departments of Environmental Protection and Environmental Management to review its options for managing/ removing/controlling the growth of noxious aquatic weeds, as well as funding sources and grant opportunities for implementing the Town's preferred option. Responsible Municipal Entity: This should be a joint effort between the Board of Selectmen and the Conservation Commission. If there is an active lake/pond association in place for an affected waterbody, then these people should be involved in the

process.

2. The Town's Subdivision Regulations should update its stormwater management and erosion control provisions. Items to address during the update process should include: the ability of new drainage structures to accommodate the expected levels of stormwater runoff generated by the subdivision; the ability of down-slope drainage facilities to accommodate the expected levels stormwater generated by the new subdivision; and soil erosion control measures for both during and after the construction phase. Addressing the above items will require the adoption of specific stormwater management/erosion control standards within the Subdivision Regulations. Such standards should be developed with the help of a certified, licensed civil engineer with experience in such matters. Responsible Municipal Entity: the Planning Board.

3. The Town should investigate its options, both regulatory and non-regulatory, for addressing non-point pollution sources. Updating the stormwater management/erosion control provisions in the Subdivision Regulations, as suggested above, would be a regulatory attempt to address non-point pollution. Non-regulatory options for addressing non-point pollution could include the following:

- Reducing the amount of road salt used by the Highway Department within the groundwater contribution areas of Dudley's three municipal well fields (Responsible Municipal Entity: Highway Department);
- Having Dudley participate in any regional or inter-community household hazardous waste collection day, or sponsoring such a day on its own (Responsible Municipal Entity: Board of Selectmen and Transfer Station personnel);
- Having household hazardous waste education pamphlets available at the Town Hall. Such pamphlets have already been prepared by the Massachusetts Departments of Environmental Protection and Environmental Management (Responsible Municipal Entity: Conservation Commission or Board of Health);
- Having pamphlets on the proper maintenance of septic systems/leachfields available at the Town Hall. Such pamphlets have already been prepared by the Massachusetts Departments of Environmental Protection and Environmental Management (Responsible Municipal Entity: Board of Health);
- Working with owners of environmentally sensitive properties to protect these resources through the various land protection programs offered by the State (Responsible Municipal Entity: Conservation Commission and/or Dudley Land Trust); and
- Having the regional USDA office work with Dudley's active farmers on smart farming practices, such as: enclosed manure storage facilities and low impact fertilization techniques.

4. In an effort to create a baseline of water quality data for Dudley's ponds/rivers/streams, the Town should consider supporting an organization of interested citizens (or school groups) willing to participate in an annual water quality monitoring program. Currently, there are no citizen groups collecting water quality data on Dudley's behalf. The Town could support such a group by paying for sampling equipment and training. Citizens can be trained in water quality

sampling techniques very easily and there are two entities that can assist the Town in setting up a citizen's water quality monitoring program: the Massachusetts Division of Fish, Wildlife and Law Enforcement (DFWLE) can train citizens under its Riverways Program; and the Massachusetts Audubon Society has also worked with citizens to set up local water quality monitoring efforts. Responsible Municipal Entity: Conservation Commission.

5. In an effort to protect the environment *and* preserve Dudley's agricultural heritage, the Town should investigate its options for protecting its "Prime Farmlands" as designated by the USDA's Natural Resources Conservation Service. There are a variety of ways to protect land from development, and these methods will be discussed in detail in the Open Space and Recreation chapter. Responsible Municipal Entity: Conservation Commission and/or Dudley Land Trust.

6. The Town should continue its membership in the Worcester Regional Transit Authority (WRTA) and support its efforts to provide public transportation alternatives on a regional scale. A viable para-transit system keeps cars off the roads, which in turn helps improve air quality and water quality. Responsible Municipal Entity: The Board of Selectmen and Dudley's representatives to the WRTA.

7. The Conservation Commission should stringently enforce the provisions of the State's River Protection Act, particularly along the undisturbed portions of the Quinebaug River. Responsible Municipal Entity: Conservation Commission.